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Automated Generation of Three-Dimensional Virtual Worlds
for Task Explanation
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Quarterly Report
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During this quarter, Norman Chin presented a paper on our work on analytic shadow-generation for convex area light sources at the *1992 Symposium on Interactive 3D Graphics* [1]. An image created using our implementation was also submitted to and accepted for the *SIGGRAPH '92* Technical Slide Set. A variant on this work is incorporated in the visibility checking algorithm we use in our IBIS intent-based illustration system, which is part of our knowledge-based augmented reality testbed. The visibility checking algorithm is described in a paper that was accepted for publication in *The Visual Computer* [3].

We did further work on improving the registration of virtual graphics with the physical world within our testbed, and extended the IBIS rule base that we are developing for designing graphics presentations that are overlaid on the user's view of the world. Prof. Feiner and Ph.D. student Blair MacIntyre presented a paper on this system at *Graphics Interface '92*[2].

During this quarter we gave invited talks that discussed our ONR-supported work at the Media Lab, MIT (Cambridge, MA, April 2, 1992), U. Penn Dept. of CS Graphics Day (Philadephia, PA, April 8, 1992), Tecnopolis (Bari, Italy, May 25, 1992), and *AVI '92 (International Workshop on Advanced Visual Interfaces)* (Rome, Italy, May 27–29, 1992). We gave a well-received tutorial on knowledge-based graphics at *CHI '92* with J. Mackinlay of Xerox PARC and J. Marks of DEC CRL, and a *SIGGRAPH '92* tutorial proposal on visualization (with I. Jarett, and C. Machover) was accepted. Prof. Feiner agreed to co-edit a special issue on virtual worlds for *ACM Transactions on Information Systems*, which is scheduled to appear in mid 1993. In March, Prof. Feiner participated in the first meeting of a Naval Studies Board NRL Workshop on Human-Computer Interaction and Artificial Intelligence.

References

[1] Chin, N. and Feiner, S. Fast object-precision shadow generation for area light sources using BSP trees. *Computer Graphics (Special Issue on 1992 Symposium on Interactive 3D Graphics)*, Cambridge, MA, March 30–April 1, 1992, 21–30.

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[2] Feiner, S., MacIntyre, B., and Seligmann, D. Annotating the real world with knowledge-based graphics on a "see-through" head-mounted display. *Proc. Graphics Interface '92*, Vancouver, Canada, May 11–15, 1992, 78–85.

[3] Feiner, S. and Seligmann, D. Cutaways and ghosting: Satisfying visibility constraints in dynamic 3D illustrations. To appear in *The Visual Computer*, 1992.